

ABSTRACT OF THE DISCLOSURE

An LC optical multiplexer according to the present invention is a two-etalon Fabry-Perot laser etched into many (> 100) sub-etalons in a rectangular array. Each sub-etalon is independently tunable and can be coupled to a distinct fiber. Any single sub-etalon or random combination of sub-etalons is free to be tuned to a particular wavelength corresponding to one of the input channels. This allows for any combination of signals (i.e. digital video, data and voice) in a signal broadband channel to be switched to any of several receivers. Wavelength division multiplexing (WDM) is used to combine or separate individual types of signals from a single fiber. Phase-matching coatings are used on the materials within the Fabry-Perot gap, thereby enhancing transmission performance of the WDM device. Mechanical techniques are used to widen the Fabry-Perot gap beyond a 100-micron LC thickness. The widening permits greatly enhanced spectral discrimination (i.e. many more WDM channels) across the device response range, which is expanded to ITU standards by use of the twin etalon configuration. A fully agile optical cross-switch of many (>100) transmitted and received channels is achieved by use of two multiplexers in an optical network.